REMARKS

Claims 1, 5-8, and 11-26 are pending in the application. Claim 1 has been amended and claims 2-4, 9-10, and 27-41 have been previously cancelled. No new matter has been added by the amendment.

Rejection Under 35 U.S.C. 102(b)

Claims 1, 5, 12, 15, and 21-26 have been rejected over Henley et al. This rejection is overcome in view of the amendment of claim 1, together with following remarks.

In claim 1, a method is recited in which two plates are bonded together. One of the two plates has a surface portion with a roughness such that the surface is incapable of sticking to the surface of the second plate. For example, FIG. 2 of the applicants' drawing illustrates one type of surface.

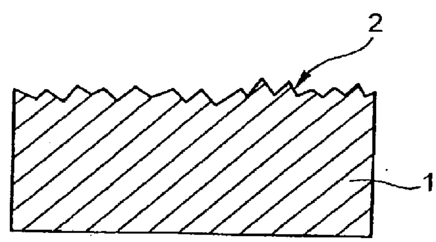

Fig.2

This surface, denoted as element 2 in FIG. 2, has a degree of roughness that will depend upon," among other things, on the thickness of the intermediate sacrificial layer, the geometrical parameters of the future component with mobile portions, and the stresses in the surface film, for example." (Substitute Specification, pg. 11, lines 27-31).

Claim 1 further recites that a sacrificial layer is produced on at least a part of the surface of the first or second plate. An example of a sacrificial layer is illustrated in FIG. 3 of the applicants' drawing.

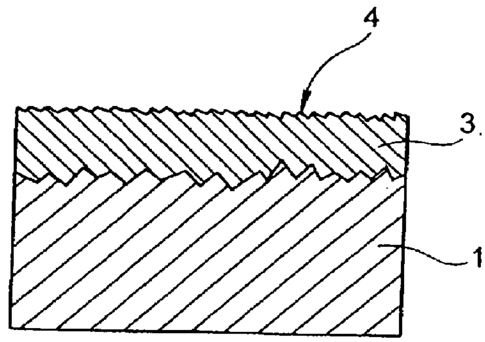

Fig.3

In the illustrated example, the sacrificial layer covers the rough surface of the plate. After producing the sacrificial layer, a second plate is bonded to the first plate.

An additional step of claim 1 includes at least partially eliminating the sacrificial layer, such that the surface portion is exposed and at least partially faces the other plate. Accordingly, because the sacrificial layer, denoted as element 3 in FIG. 3, has been at least partially eliminated, a surface portion of the rough surface, denoted as element 2 in FIG. 2, faces the other plate.

As described in the applicants' substitute specification

> "a portion of the intermediate sacrificial layer between the two plates may be eliminated, for example, to obtain two facing surfaces at least one of which is appropriately structured. This prevents the two surfaces sticking together following movement of the two substrates toward each other." (Substitute Specification, pg. 7, lines 20-25).

The importance of preventing sticking in SOI structures used in MEMS fabrication and the limitations of prevention methods of the prior art are described by the applicants in the Background section of their specification. (Substitute Specification, pg. 3, line 29 to pg. 6, line 11).

The Examiner alleges that Henley et al. disclose the applicants' process including the step of producing a sacrificial layer (114) and at least partially eliminating the sacrificial layer. (Office Action, pg. 3). The applicants assert that

there is no suggestion by Henley et al. that the planarizing layer (114) be at least partially removed and a portion of the rough surface is exposed, so that the portion faces the other substrate. As shown below in FIG. 13, Henley et al. disclose forming the planaizing layer covering the separated surface (1116).

FIG. 13

The Examiner asserts that the Henely et al. disclose eliminating the layer planarizing layer (114) by a plasma etching process and points to the following text.

> "The planarizing layer may be a layer of plasma-etched deposited oxide, for example, for example, spin-on glass, polyimide, or similar material. Preparing the surface of the donor substrate with a planarized layer of oxide or polymer prior to cleaving a subsequent thin film is desirable in some applications, especially when using a transfer wafer or backing substrate." (Col. 8, lines 12-14).

The applicants assert that Henley et al. are describing various deposition methods for forming the planarizing layer (114), and do not suggest or disclose eliminating a portion of the planarizing layer to expose a portion of the underlying surface (1116). Further, the plates of Henely et al. are configured to stick together and there is no suggestion that a surface portion of one plate be incapable of sticking to the surface of a second plate.

In view of the failure of Henely et al. to disclose each and every element of the applicants' process recited in claim 1, the applicants assert that Henely et al. does not anticipate claim 1, and this rejection should be withdrawn.

Claims 5, 12, 15, 21-25 are allowable at least in view of the amendment and remarks pertaining to claim 1, from which they directly or indirectly depend.

Claim 26 recites a stacked structure fabricated by the method of claim 1. Accordingly, this claim is allowable in view of the amendment and remarks pertaining to claim 1.

Claims 1, 6-8, 13, 16, and 18 have been rejected over Enquist. This rejection is overcome in view of the amendment of claim 1, together with the following remarks.

Enquist discloses forming a layer (12) on a first substrate (10) and polishing the layer. As shown by Enguist in FIG. 3 below, a film (17) is also formed on a second substrate (16), and the two substrates are bonded together.

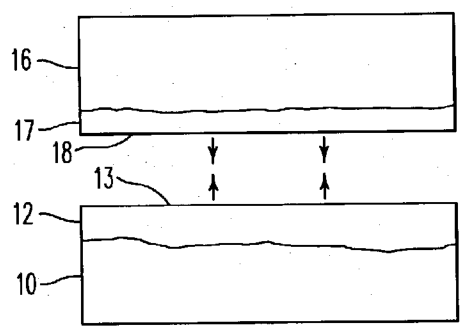

FIG. 3

While Enquist discloses that layers (12) and (17) can be polished to form planar surfaces, Enquist does not suggest or disclose partially eliminating one of the two layers to expose a surface portion of the underlying substrate, such that the portion faces the other substrate. Further, the plates of Enquist are configured to stick together and there is no suggestion that a surface portion of one plate be incapable of sticking to the surface of a second plate.

Accordingly, Enquist does not anticipate claim 1 at least because each and every element of claim 1 is not suggested or disclosed. The applicants' assert that claim 1 distinguishes over Enquist and that this rejection should be withdrawn.

Claims 6-8, 13, 16, and 18 are allowable at least in view of their direct or indirect dependence from claim 1.

Claims 1, 6, 11, and 17 have been rejected over Tong et al. This rejection is overcome in view of the amendment of claim 1, together with the following remarks.

Tong et al. disclose a bonding process in which a bonding layer (32) is formed on a substrate and a very slight etch (VSE) process is carried out to activate the surface.

> "The VSE process etches the surface very slightly via physical sputtering and/or chemical reaction and preferably is controlled to not degrade the surface roughness of the bonding surfaces." (Col. 6, lines 4-7).

The bonding layer is then bonded to a layer overlying another substrate (35) (FIGs. 3A-3E, Col. 5, line 16 to Col. 7, line 13). Additional bonding sequences are disclosed using the VSE process. Tong et al. do not suggest or disclose partially eliminating one of the two layers so that a surface portion of one substrate faces the other substrate. Further, the plates of Tong et al. are configured to stick together and there is no suggestion that a surface portion of one plate be incapable of sticking to the surface of a second plate. Accordingly, the applicants' claims distinguish over Tong et al.

Claims 6, 11, and 17 are allowable at least in view of their dependence from claim 1.

Rejection Under 35 U.S.C. 103(a)

Claim 14 has been rejected over Henley et al. in view of Maleville et al. This rejection is overcome in view of the amendment of claim 1, together with the following remarks,

The applicants' foregoing remarks pertaining to Henley et al. are incorporated herein. Maleville et al. disclose a separation process in which gas pressure from implanted elements forces a bonded structure to separate. The addition of Maleville et al. does not overcome the deficiency of Henley et al. Neither reference suggests or discloses partially eliminating one of the two layers so that a surface portion of one substrate faces the other substrate.

Claims 19-20 have been rejected over Enquist in view of Haberger et al. This rejection is overcome in view of the amendment of claim 1, together with the following remarks

The applicants' foregoing remarks pertaining to Enquist are incorporated herein. Haberger et al. disclose a bonding process in which strip-shaped channels formed (5) are formed in an oxide layer (4) overlying a wafer (2). After bonding two wafers together and further processing, an etching liquid is introduced into the channels to detach chips (9). (See, FIG. 1, Col. 6, lines 14-58). Channels can also be formed in an oxide layer overlying the other wafer.

The applicants assert that their claims are not obvious in view of the cited references. Claim 1, as amended, recites method in which a surface portion of a plate has a roughened surface. Through partial elimination of the sacrificial layer, the surface portion is incapable of sticking to a surface of another plate. Upon bonding the first and second plates, the surface portion faces the other plate. Neither of the cited references suggests or discloses exposing a non-sticking surface portion of one plate to the other plate, though at least partial elimination of a sacrificial layer. Accordingly, claims 19 and 20 distinguish over the cited references at least in view of their indirect dependence from claim 1.

The applicants have made novel and non-obvious contributions of the art of stacked device structure fabrication. The claims at issue distinguish over the

cited references and are in condition for allowance. Accordingly, such allowances now earnestly request it.

Respectfully submitted,

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